

Environmental Safety & Health Requirements for a Federal Facility

G.W. Campbell
J.K. Wong

This paper was prepared for submittal to
Hazmacon 1995 Conference
San Jose, CA
April 4-6, 1995

February 1995



Lawrence
Livermore
National
Laboratory

This is a preprint of a paper intended for publication in a journal or proceedings. Since changes may be made before publication, this preprint is made available with the understanding that it will not be cited or reproduced without the permission of the author.

DISCLAIMER

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the University of California nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the University of California, and shall not be used for advertising or product endorsement purposes.

ENVIRONMENTAL SAFETY & HEALTH REQUIREMENTS FOR A FEDERAL FACILITY

George Campbell, CHCM, CHMM Joel Wong CIH, CSP, REA
Hazards Control Department
Lawrence Livermore National Laboratory
P.O. Box 808, L-382
Livermore, CA 94550

INTRODUCTION

I would like to take this opportunity to discuss the challenges that face an environmental, safety, and health (ES&H) manager at a federal facility situated in California. The challenges are, in many aspects, similar to those facing ES&H professionals all over this country: dwindling resources and increasing regulatory demands. The Laboratory (LLNL) is under closer scrutiny than other R&D facilities located in California because some of its research activities involve nuclear weapon design.

Today, I would like to talk about two actions we, the ES&H management at LLNL, have taken to decrease the impact of dwindling resources and increasing regulatory demands:

1. Institution of a performance-based contract, which the University of California negotiated with the Department of Energy (DOE) to reduce the impact of special mandates required of federal facilities. Under this contract, ES&H performance is measured by results rather than by process.
2. Redesign of the LLNL Hazards Control Department to a flat organization that incorporates employee empowerment and Self-Managed Work Teams (SMWTs).

GENERAL DESCRIPTION OF THE LABORATORY

LLNL is a Government-Owned Contractor-Operated (GOCO) research laboratory owned by the DOE and operated by the University of California. Originally founded as a nuclear weapons research facility about forty years ago, LLNL has evolved into a multidisciplinary research laboratory with new emphasis on national security, biomedical, and environmental research.

The Laboratory is situated in Livermore, California, and about 50 miles southeast of San Francisco and 42 miles southeast of Oakland. It occupies an area of about one square mile and has a population of approximately 8000 University of California employees and 1000 contractor employees. Site 300, which is about 30 minutes east of the LLNL main site, is a remote area where experiments with high explosives are conducted. The total area of all Laboratory facilities is over one-half million square feet. The Laboratory has a total budget of about one billion dollars for FY 1995.

The scope of research conducted at LLNL includes physics and space technology; defense systems science and technology; nuclear science and technology; high-performance computations; high-performance lasers; advanced sensors and instrumentation; energy science and technologies; environmental technologies; biology

and biotechnology, including genomics; atmospheric science; large-scale science systems; and precision manufacturing.

ENVIRONMENTAL, SAFETY, AND HEALTH CHALLENGES

Because LLNL is a federal facility, it is under a myriad of federal, state, and local ES&H laws and jurisdictions. In the area of health and safety, the Laboratory is under both DOE and OSHA regulations and under the jurisdiction of DOE, EPA, California, Alameda County, and City of Livermore (among others) for environmental areas.

Compliance with ES&H laws and regulations under all these jurisdictions is very complicated because the regulations themselves are complicated and often conflict with each other. For example, LLNL is a DOE Defense Programs (DP) site operated under the jurisdiction and guidelines of DP. Because many of the environmental remediation and restoration projects are funded by DOE Environmental Management Program (EM), many parts of the Laboratory are also under EM's jurisdiction. Furthermore, in the area of ES&H, the Laboratory must comply with over 50 DOE Environmental, Safety, and Health Program (EH) Orders, in addition to external regulations with which all facilities in California have to comply. These DOE Orders contain over 400 policy statements, 4500 specific requirements, 2500 guidance statements, and 40 technical standards statements.

Example of Over-regulation

Many of the DOE Orders have good intentions. But when they are actually applied to the field, they could become burdensome without commensurate benefits. For example, implementation of specific EH requirements in the DOE *Radiation Control Manual* (RadCon Manual) require spending a lot of our resources and the benefit is not significant. When this Manual was issued in June 1992, the Laboratory's existing Radiation Safety Program was already in compliance with approximately 85% of the requirements. The cost of fully implementing the remaining 15% requirements in the RadCon Manual was estimated to be \$4 million the first year and about \$2 million per year for recurring cost.

For the past five years, the occupational radiation doses at LLNL have been in the range of 30-35 person-rem per year. Full implementation of the RadCon Manual will not have a significant effect on reducing occupational radiation doses at LLNL, because the reduction in dose would be negligible and the cost in dollars expended would be more than \$1 million dollars per man-rem. This contrasts \$1000 per man-rem that has often been used as a rule of thumb to determine whether, from a cost-benefit standpoint, an expenditure of funds to reduce radiation dose is warranted.

Many Inspection/Audit Activities

LLNL is subjected to many inspections and audits because it is under the jurisdiction of several DOE organizations (EH, DP, EM etc.) and is overseen by non-regulatory advisory boards, such as the Defense Nuclear Facility Safety Board (DNFSB).

In addition, because of public concerns and the Laboratory's handling of plutonium and other "exotic" materials, LLNL is inspected and audited more frequently by federal, state, and local authorities than other similar facilities in the state. In all cases, The Laboratory acts responsibly and cooperates with regulators to the best of its abilities. As you may know audits and inspections take a significant amount of time and resources.

The Laboratory has taken the two proactive actions to address the problems previously mentioned:

1. **Contract 48, Performance-based ES&H Measures.** On October 1 1992, the University of California negotiated with DOE a contract that places high emphasis on ES&H Performance. Appendix F of this Contract, which includes specific, objective performance measurement goals established by the UC (with Laboratory input) and DOE, requires the Laboratory to conduct an annual self-assessment to evaluate its management performance. This self-assessment may involve participation by external entities, including one or more of the other UC Laboratories.

The self-assessment process ultimately results in a management rating by the UC for LLNL. Any findings are conveyed to the local DOE Field Office in Oakland, California, and used by the UC and DOE to determine the Laboratory's Executive Merit Pool salary package. For FY 1995, the Laboratory must meet performance measures in the two major areas: science and technology and administrative services. The Contract considers both these areas to be of equal importance—each is worth 50% of the points awarded.

There are nine categories for administrative services: ES&H, Financial Management, Human Resources, Procurement, Property Management, Safeguard and Security, Facilities Management, Information Management, and Institutional Laboratory Management. It is important to note that ES&H is considered a high priority because the maximum possible points that can be awarded to this category amounts to 11% of the total score.

Because these performance measures are based on results, not processes, they have the net effect of reducing DOE management oversight and increasing the attention paid to the bottom line (i.e., performance). This is the third year LLNL has used this Performance Measure Contract and, from all indications, things are working well.

Let me briefly discuss how the ES&H Performance Measures are set up.

a. The Goals of the Performance Measures. The goals of Appendix F are to provide for a high order of assurance through a performance measurement system that ensures a safe and healthful environment in which to pursue research and development and promotes continuous improvement of that environment as we strive for excellence. These goals are accomplished in ES&H programs by the joint DOE/UC/LLNL development of performance measures that are based on common goals and expectations, and designed to evaluate or assess the effectiveness of systems and programs to protect workers, the public, and the environment.

b. Assumptions of the Performance Measures. To realize the stated goals, we have developed a system that does the following:

- Promotes performance-based oversight to ensure protection of workers, the public, and the environment.
- Provides a mechanism for promoting excellence and assessing performance.
- Encourages the development of performance measures that are based on common goals and expectations. These measures are designed to evaluate or

assess the effectiveness of systems and programs to protect the worker, the public, and the environment.

There are five ES&H performance objectives for FY 95, which are quoted as outlined in Contract 48, Appendix F. The major categories of these objectives are as follows:

OBJECTIVE #1 PROTECTION AND PREVENTION

The Laboratory will conduct operations in a safe manner that protects human health, the environment, and the public and prevents adverse impacts thereon.

1.1 Effective Protection and Prevention Systems: An effective Environment, Safety, and Health Program will identify, control, and respond to hazards. The intent of the following group of performance measures is to assure that the Laboratory's ES&H systems effectively address protection and prevention. They represent key protection and prevention elements that are adequate to demonstrate the effectiveness of ES&H systems. (Weight = 40%)

- 1.1.a Radiation Protection of Workers
- 1.1.b Radiation Protection of the Public
- 1.1.c Exposure Prevention
- 1.1.d Accident Prevention
- 1.1.e Process Waste Minimization
- 1.1.f Solid Waste Minimization
- 1.1.g Medical and Industrial Hygiene Interface
- 1.1.h Source Reduction and Pollution Prevention

OBJECTIVE #2 COMPLIANCE

The Laboratory will comply with applicable Federal, State and local ES&H laws, regulations and ordinances and with applicable and accepted DOE directives.

2.1 Effective Compliance Programs: The Laboratory will have effective programs in place designed to achieve compliance with applicable Federal, State and local laws, regulations and ordinances and, where cost- beneficial, with applicable DOE orders as provided in Article XV, Clause 3 of the prime contract. The intent of the following performance measures is to assure the Laboratory's ES&H systems effectively address compliance. They represent key compliance elements that are adequate to demonstrate the effectiveness of ES&H compliance systems. (Weight = 15%)

- 2.1.a Tracking and Trending of Findings and Violations
- 2.1.b Tracking and Trending of Environmental Releases
- 2.1.c Occupational Safety and Health

2.2 Regulatory Response: The Laboratory will be responsive to regulatory agencies. (Weight = 5%)

- 2.2.a Regulatory Commitments

OBJECTIVE #3 INTEGRATION AND ACCOUNTABILITY

The Laboratory program and line management is accountable for integration of ES&H programs into all programs and operations.

3.1 Project Planning: The managers of Laboratory projects properly plan and execute projects with due regard for ES&H issues such that adverse consequences relative to ES&H can be prevented and additional costs relative to addressing ES&H issues can be minimized. (Weight = 5 %)

3.1.a Integration

3.2 Budgetary and Planning Reports: Timely, accurate, and complete ES&H budgetary and planning information and required reports submitted to DOE. (Weight = 5%)

3.2.a Completion of Milestones

3.3 Roles, Responsibilities and Authorities: Each Laboratory will clearly define and communicate roles, responsibilities and authorities. The intent of the following performance measure is to minimize confusion regarding ES&H roles, responsibilities and authorities and to aid in holding staff and managers accountable. (Weight = 5%)

3.3.a Accountability

3.3.b Completion of DOE Mandated Training

3.4 Conduct of Operations: Conduct of operations principles are integrated into Laboratory programs and operations. (Weight = 15%)

3.4.a Implementation Plan

3.4.b Corrective Actions

3.4.c Control of Radioactive Materials

3.4.d Operating Parameters

OBJECTIVE #4 RISK MANAGEMENT AND RESOURCE ALLOCATION

The Laboratory will ensure that for its programs and operations, ES&H risks are analyzed and risk reduction resources are allocated appropriately. (Refer to Laboratory Management Performance Measure 1.4.a for allocation of risk reduction resources.)

4.1 Hazard Identification: The Laboratory identifies significant hazards to guide management in the allocation of institutionally-managed ES&H resources. (Weight = 5%)

4.1.a Risk Assessment

OBJECTIVE #5 CUSTOMER SATISFACTION

The Laboratory will conduct its business in a manner that meets or exceeds customer expectations and, through continuous communications, will foster customer and stakeholder mutual trust and credibility. (For stakeholder

trust and credibility and for internal customer focus, refer to Laboratory Management Performance Measure 2.1.a.)

5.1 Customer Focus: Effective ES&H programs will incorporate expectations of customers and stakeholders. Three elements should be considered: continuous improvements, relative comparisons or benchmarks and quality (excellence). (Weight = 5%)

5.1.a Regulatory Customer Satisfaction

2. Redesign of the Hazards Control Department. The Hazards Control Department was redesigned to emphasize Accident Prevention, ES&H excellence, customer satisfaction, and effective teamwork.

Originally, the Hazards Control Department was a typical hierarchical organization with several layers of management. At an All-Hands meeting on April 7 1993, we initiated a Continuous Quality Improvement process that was named the Accident Prevention Program. Simultaneously, we surveyed customers and employees to define, from their perspectives, the strengths and weaknesses of the Department. The Department also identified the following issues as constraints/drivers to work effectively with their customers and for employees to work together as an effective team within the Department:

- DOE's emphasis on prescriptive regulation
- Department Head's desire for Hazards Control to have greater impact on creating a more proactive safety and health culture at LLNL
- A reduction in funding ("need to do more, faster, for less")
- Laboratory employees and community want more participative management and increased communication
- Downsize of the Laboratory's population and projects
- VERIP III (early retirement incentive for eligible employees)
- A change in LLNL's mission (reduced emphasis on weaponry)
- Multiple communication layers.
- Decreased LLNL and community tolerance of risk
- Increased LLNL involvement with private-sector business community.
- Expectation for greater cooperation between the Hazards Control Department, Health Services, and the Environmental Protection Department
- National emphasis on reducing big government
- Workforce diversity
- An increase in the need for entry-level and continuing training/education
- Competition for providing ES&H services

In June 1993, approximately 50 volunteers participated in offsite meetings to explore ways to develop and organize ideas to effect the desired improvement. The ideas were consolidated into workable clusters for specific attention. The seven Task Groups that resulted from this consolidation were

- Communications
- Customers
- Optimization
- Risk & Regulation
- Skills, Knowledge, and Abilities

- Purpose, Mission, and Vision
- Trust

The Task Groups worked through the summer and presented their recommendations to the Review Advisory Group, which comprised representatives from each Task Group and the Division Leaders. Information developed by these groups was crucial to the structural change and development of a new culture.

a. Improvements. To directly meet the above drivers/constraints, to empower the employees, and to do more with less resources, several possible organizational models (flat, hierarchical, functional, and a modification of the existing structure) were examined. Of these, a flat structure seemed to be the most effective for the Hazards Control Department in order to provide quality support to the Laboratory. A key component of the Department's reorganization was the development of Self-Managed Work Teams (SMWTs), which would enable the Department's employees to make more decisions and at a level much closer to customers. The Department was formally re-organized in November 1993. Since this date, the Department has developed a Strategic Plan that continuously attempts to improve the quality of its ES&H excellence, customer satisfaction, and effective team work among employees.

b. Metrics Demonstrating Magnitude of Improvement. Thus far, we have been successful as demonstrated by the following four metrics:

- VERIP III—More than 30 positions were eliminated. The Department is doing more with less resources.
- The number of managers and supervisors was reduced from 41 to 17 positions. Self-Managed Work Teams were formed to better serve customers.
- A post reorganization customer survey indicated that the Department is still meeting customers' expectations with no perceived reduction in services.
- The Department has absorbed an 8% budget reduction in FY '94 with no loss of services and/or customer satisfaction.

CONCLUSION

All ES&H managers face the dilemma of dwindling resources and increasing regulatory demands. At the Lawrence Livermore National Laboratory, we are taking two proactive actions to solve this dilemma. We have gone to a performance-based ES&H system, and we have flattened our organization to better serve our customers. Early results are indicating that these strategies are working.

ACKNOWLEDGEMENTS

Work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.

Technical Information Department • Lawrence Livermore National Laboratory
University of California • Livermore, California 94551

